IN THE CLAIMS:

1. (Currently Amended) A cross-linking compound which comprises:

(a) an anhydrous hydrocarbon compound liquid at ambient temperature;

(b) having at least one di- or poly- Group VI-A element of the periodic table of elements; and

(c) a natural or synthetic polymer liquid at ambient temperature having a molecular weight less than 25,000, wherein said anhydrous hydrocarbon compound, said Group VI-A element, and said polymer are dissolvable or digestible in asphalt to react under heat of from greater than 110°C to produce a cross-linked polymer modified asphalt.

2. (Original) A cross-linking compound as set forth in Claim 1 wherein said Group VI-A element is sulfur.

3. (Original) A cross-linking compound as set forth in Claim 1 wherein said polymer is a multi-component polymer.

4. (Original) A cross-linking compound as set forth in Claim 1 wherein said polymer is saturated.

5. (Original) A cross-linking compound as set forth in Claim 1 wherein said polymer contains functional groups.

6. (Withdrawn) A cross-linking compound as set forth in Claim 1 wherein said polymer is hydroxy terminated polybutadiene.

7. (Original) A cross-linking compound as set forth in Claim 1 wherein said polymer contains two or more chemical moieties.

8. (Original) A cross-linking compound as set forth in Claim 7 wherein said polymer is a copolymer of butylene and butene.

9. (Withdrawn) A cross-linking compound as set forth in Claim 1 including aldehyde, phenol, phenol-aldehyde, melamine or epoxy resins.

10. (Withdrawn) A cross-linking compound as set forth in Claim 9 wherein said epoxy resins contains glycidyl moieties.

11. (Canceled)

12. (Currently Amended) A cross-linking compound which comprises:

(a) an anhydrous hydrocarbon compound liquid at ambient temperature;

(b) molecules or chemical moieties having two or more Group VI-A elements of the periodic table of elements; and

(c) a natural or synthetic polymer liquid at ambient temperature having a molecular weight less than 25,000, wherein said anhydrous hydrocarbon compound, said molecules or moieties, and said polymer are dissolvable or digestible in asphalt to react under heat of from greater than 110°C to produce a cross-linked polymer modified asphalt.

13. (Original) A cross-linking compound as set forth in Claim 12 wherein said polymer is a multi-component polymer.

14. (Original) A cross-linking compound as set forth in Claim 12 wherein said polymer is saturated.

15. (Original) A cross-linking compound as set forth in Claim 12 wherein said polymer contains functional groups.

16. (Withdrawn) A cross-linking compound as set forth in Claim 15 wherein said polymer is hydroxy terminated polybutadiene.

17. (Original) A cross-linking compound as set forth in Claim 12 wherein said polymer contains two or more chemical moieties.

18. (Original) A cross-linking compound as set forth in Claim 17 wherein said polymer is a copolymer of butylene and butene.

19. (Original) A cross-linking compound as set forth in Claim 12 wherein said Group VI-A elements of the periodic table of elements are in terminal positions on the molecules or chemical moieties.

20. (Original) A cross-linking compound as set forth in Claim 19 wherein at least one of said Group VI-A elements of the periodic table of elements is sulfur.

21. (Original) A cross-linking compound as set forth in Claim 20 wherein the molecules or chemical moieties are mercaptans.

22. (Original) A cross-linking compound as set forth in Claim 12 wherein said Group VI-A elements of the periodic table of elements are not in the terminal position of the molecules or chemical moieties.

23. (Original) A cross-linking compound as set forth in Claim 22 wherein said Group VI-A elements of the periodic table of elements are poly-element moieties within the molecules or chemical moieties.

24. (Original) A cross-linking compound as set forth in Claim 23 wherein at least one of said Group VI-A elements is sulfur.

25. (Original) A cross-linking compound as set forth in Claim 23 wherein the molecules or chemical moieties are Di-tert-butyl polysulfide, Di-tert-dodecyl polysulfide, Di-tert-nonyl polysulfide or combinations thereof.

26. (Original) A cross-linking compound as set forth in Claim 23 wherein the poly-element moiety is poly-sulfide.

27. (Withdrawn) A cross-linking compound as set forth in Claim 23 including additional cross-linking agents of aldehydes, phenols, phenol-aldehydes, melamine resins or epoxy resins.

28. (Withdrawn) A cross-linking compound as set forth in Claim 23 wherein said epoxy resin contains glycidyl moieties.

29. (Withdrawn) A cross-linking compound as set forth in Claim 28 wherein the glycidyl moiety is neodecanoic acid, oxiramylmethyl ester.

30. (Withdrawn) A cross-linking compound as set forth in Claim 1 including vulcanization accelerators or co-reactant.

31. (Withdrawn) A cross-linking compound as set forth in Claim 30 wherein the accelerator or co-reactant is Tetramethyl Thiuram Disulfide.

32. (Withdrawn) A cross-linking compound as set forth in Claim 30 wherein the accelerator or co-reactant is Tetrabutylthiuram Disulfide.

33. (Withdrawn) A cross-linking compound as set forth in Claim 30 wherein the accelerator or co-reactant is a room temperature accelerator or co-reactant.

34. (Withdrawn) A cross-linking compound as set forth in Claim 30 wherein the accelerator or co-reactant is Dimethyl Cyclohexyl Ammonium Dibutyl Dithiocarbamate.

35. (Withdrawn) A cross-linking compound as set forth in Claim 1 including organic oils or solvents.

Claims 36 through 38 (Canceled)

39. (Withdrawn) A cross-linking compound as set forth in Claim 35 wherein the organic oils or solvents are derived from natural oils.

40. (Withdrawn) A cross-linking compound as set forth in Claim 39 wherein the natural oils are of either animal or vegetable origin.

41. (Withdrawn) A cross-linking compound as set forth in Claim 39 wherein the oil is of vegetable origin.

42. (Withdrawn) A cross-linking compound as set forth in Claim 35 wherein the organic oils or solvents contain elements of Group V-A of the periodic table of elements.

43. (Withdrawn) A cross-linking compound as set forth in Claim 42 wherein the Group V-A elements contained in said oils or solvents is either phosphorous or nitrogen or both.

44. (Withdrawn) A cross-linking compound as set forth in Claim 43 wherein said oils or solvents containing both phosphorous and nitrogen is lecithin.

45. (Withdrawn) A cross-linking compound as set forth in Claim 1 which includes chemical moieties capable of forming an oxidation-reduction reaction.

46. (Withdrawn) A cross-linking compound as set forth in Claim 45 wherein the chemical moieties capable of forming a oxidation-reduction reaction are iron sulfate and iron chloride.

Claims 47 and 48 (Canceled)

49. (Currently Amended) A cross-linking compound which comprises:

(a) an anhydrous hydrocarbon compound liquid at ambient temperature having elemental sulfur, oxygen or selenium therein, wherein said hydrocarbon compound is Di-tert-butyl polysulfide, Di-tert-dodecyl polysulfide, Di-tert-nonyl polysulfide or combinations thereof; and

(b) an ethylenic polymer liquid at ambient temperature having a molecular weight less than 25,000, wherein said polymer is a copolymer of butylene and butene, wherein said anhydrous compound having sulfur, oxygen, or selenium therein, and said polymer are dissolvable or digestible in asphalt to react under heat of from greater than 110°C to produce a cross-linked polymer modified asphalt.

50. (Original) A cross-linking compound as set forth in Claim 1 wherein said anhydrous hydrocarbon compound is an organic process oil from crude or coal processing.

51. (Original) A cross-linking compound as set forth in Claim 12 wherein said anhydrous hydrocarbon compound is an organic process oil from crude or coal processing.